269* Cystic Fibrosis related diabetes: the presence of microvascular diabetic complications

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Cystic fibrosis related diabetes (CFRD) has been regarded as a mild form of diabetes with a low risk of severe diabetic complications. The prevalence and severity of CFRD increases with age, resulting in a 50% prevalence of diabetes at 30 years of age.

Objective: To investigate whether microvascular complications in CFRD appear with a clinically relevant frequency.

Research Design and Methods: Thirty-eight patients above 18 years of age with insulin treated CFRD in our department were screened for late diabetic complications.

Results: Since the pharmacological treatment with i.e. cyclosporine of lungtransplanted patients could influence the metabolical regulation and renal function, the results are given separately for non-transplanted (n=29) and transplanted (n=9) CF patients. Nine patients (27%) had retinopathy, two of which had proliferative retinopathy and needed laser treatment. Lung transplantation did not affect the prevalence of retinopathy. Nine out of 29 non-transplanted patients had hypertension, 3 microalbuminuria and 1 elevated creatinine. None had macroalbuminuria. In transplanted patients, 8 out of 9 had hypertension, 2 had microalbuminuria and none had macroalbuminuria. Seven of the 9 lung transplanted patients had elevated plasma creatinine and severely reduced glomerular filtration rate was significantly more frequent.

Conclusions: A high frequency of diabetic retinopathy was found in patients with insulin treated CFRD, stressing the need for regular screening. Severely impaired kidney function was common in lungtransplanted patients, probably secondary to cyclosporine treatment.

270* Decline in lung function and BMI prior to the diagnosis of CFRD and the impact of gender

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Introduction: An accelerated decline in lung function and BMI can precede the development of CFRD by up to 6 years. A recent study suggested the earlier mortality was only seen in females with CFRD.

Aims: To establish if a decline in lung function and BMI occurred prior to the diagnosis of CFRD and the impact of gender.

Methods: A retrospective notes review of all patients diagnosed with CFRD after 1985. The best value for FEV1 and BMI for each of the 6 years preceding the diagnosis was recorded (years –6 to 0, with year –6 as baseline). CF controls were matched for age and sex. Annual rate of change for FEV1 and BMI were calculated and compared using the students test, with significance set at 0.05.

Results: 21 patients developed CFRD (8 female; 13 male). Mean age at diagnosis was 28.9 years (22.9 yrs at baseline), mean FEV1 1.88L (52.1% pred), mean BMI 20.3. Controls mean FEV1 was 2.4L (61.4%), mean BMI 20.6. The mean %change in FEV1/yr in CFRD was –5.77%/yr vs. controls –1.61%/yr ($p=0.003$). The mean %change in FEV1/yr was greater in females than males (–9.81%/yr vs. –3.28%/yr, $p=0.002$). BMI changes were small but statistically significantly different (mean %change/yr for CFRD +0.05 vs. controls +1.4, $p=0.01$). In CFRD males mean change in BMI/yr was +0.4 vs. –0.2 in females ($p=0.02$); there was no significant gender difference in controls.

Conclusions: The decline in lung function prior to the diagnosis of CFRD was seen in females not males. BMI showed little change over time. CFRD patients did not improve their BMI as much as controls; again females did worse. The worse outcomes for females support the CFRD mortality data previously reported.

271* Is earlier development of CFRD one possible reason for worse clinical findings in women with CFRD?

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It is well known that patients with Cystic Fibrosis related Diabetes Mellitus (CFRD) are in worse clinical condition compared to patients without CFRD. An actual cross-sectional study demonstrated that only women with established CFRD have a significantly worse lung function than a control group without CFRD. Male CFRD-patients and women with newly diagnosed CFRD don't have a worse lung function. This cross-sectional study could not answer the question, in which age the CFRD was diagnosed in men respectively women and if a possible longer duration of CFRD could contribute to the observed gender difference.

In a large multicentre study in Germany and Austria we followed a huge number of CF-patients with annual OGTT. This offered the opportunity to calculate the mean age of first glucose disturbance and the age when CFRD was diagnosed for the first time. This data were calculated and compared for sex differences using Kaplan–Meier-analysis.

Between 2002 and 2005 we performed 2646 oral glucose-tolerance-tests in 1334 CF-patients. In Kaplan-Meier-analysis the median age for the first pathologic OGT-test was 26.2 years (1st quartile: 17.3 years) with no gender difference. CFRD occurred significantly earlier in female than in male patients (female 1st quartile: 29.7 years, male 1st quartile: 35.3 years). By age of 18, diabetes was diagnosed in 12.5% of female compared to 4.1% of male patients based on two independent diabetic OGT-tests.

The longer duration of the CFRD in female patients might be one reason for the worse clinical condition described in cross-sectional studies. Nevertheless it is still open why female patients developed CFRD earlier.

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272 Use of continuous subcutaneous glucose monitoring system (CSGMS) in the management of CFRD: the CFRD team and patient perspective

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Introduction: Management of type 1 diabetes with insulin and the need for regular blood glucose monitoring is a burden for patients and adversely affects quality of life. Achieving good glycemic control can be difficult and CSGMS is regularly used to adjust insulin therapy. In CFRD the burden of treatment is even greater, the need for good glycemic control just as important, and the value of CSGMS in improving control unclear.

Aim: To assess the value of CSGMS in determining insulin therapy and staff and patient response to this.

Methods: All patients with CFRD underwent CSGMS as part of routine clinical care, recording insulin use, meals and snacks. Insulin (basal/bolus) therapy was modified according to the results. Patients answered a simple questionnaire about their experience of CSGMS.

Results: 10 patients underwent CSGMS. Analysis of CSGMS led most often to a reduction in basal insulin and/or addition of short-acting insulin to cover snacks. Diabetic control improved in 9 patients: mean HbA1c before 7.69%, after 7.62%, the number of patients experiencing hypos fell from 6 to 3 (2-substantially less hypos), and 6 patients gained weight. Thus staff felt CSGMS was useful in improving glycemic control. 80% of patients had problems wearing the device (unable to bathe/noisy/uncomfortable). All patients felt using the device and feedback on the results helped them to understand their diabetes better, particularly the relevance of good glycemic control to their CF. Most felt empowered to manage their disease better and were more optimistic and positive about diabetes management.

Conclusions: CSGMS is well received by patients and staff, and useful in improving glycemic control.